

RICHMOND POLICE DEPARTMENT



11-15 FORENSICS / EVIDENCE COLLECTION OPERATING MANUAL

Rodney D. Mance

Chief of Police or Designee

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PURPOSE

The purpose of this manual is to establish operational procedures for the Forensics Unit and to provide procedures for Department personnel regarding the collection, preservation and submission of evidence.

MISSION

The objective of this manual is to provide Department personnel with practical information concerning how to use physical evidence to assist in a criminal investigation. This guide is a reference for the procedures for the collection, preservation, and submission of the evidence. This guide is not intended to cover all situations or to supersede Department directives.

The Forensics Unit is primarily responsible for processing crime scenes, evidence collection and for all facets of identification and latent prints. The Forensic Team is available on a 24- hour basis to process crime scenes. There is someone working out of the office from 0800 to 0100 hours. The hours of 0100 to 0800 are covered on a call-out basis.

PERSONNEL

Organization

The forensic unit is comprised of a Lieutenant, 2 Sergeants, 6 Detectives, and 3 Civilians (2 Forensic Technicians and a Photographer). The members of the Forensic unit are all full-time employees of the Richmond Police Department.

Lieutenant

The lieutenant is the OIC of the unit and is responsible for the day to day operations of the unit. He/She is subject to call out at any time to supervise the operations of the unit. The lieutenant has 2 sergeants under him/her and they in turn have Detectives and Civilians that work for them.

Sergeants

The sergeants are on call 2 weeks out of the month and are subject to respond to homicides, FIT Calls, and life-threatening aggravated assaults. When they respond they are responsible for supervising the Forensics personnel and making sure that everything is done that needs to be done at the crime scene. They also act as a liaison between the other Major Crimes Detectives and Sergeants.

Forensic Detectives/ Forensic Technicians (Civilians)

The Detectives/Technicians respond to homicides, aggravated assaults, rapes, police involved shootings (FIT Calls), or any other scene that may be deemed necessary. They are to process the crime scene and assist Major Crimes (or any other requesting unit of the police department) with their investigation.

Photographer (Civilian)

The photographer provides technical support to the Forensic Unit in regards to documenting the crime scene through photography. The photographer takes photos for events in the Richmond Police Department and helps out on crime scenes when needed. The photographer maintains the photographic equipment and the processing of any film or digital imagery that needs processing.

Selection to the Forensic Unit

When a position becomes available in the Forensics Unit, interested personnel must first apply for the position then go through an interview process. The interview process for Detectives consists of a panel interview which includes a review of a previous case folder that the applicant submits, a copy of their last performance evaluation, and a series of questions designed to test their suitability for the position. The panel consists of Forensic Detectives and Major Crime Supervisors. Further information regarding the application process can be found in General Order 2-2 Allocation and Distribution of Personnel.

The Detectives assigned to Forensics have the same departmental requirements that Police Officers have to stay in employed in this capacity. The civilians in the Forensic unit are subject to these same requirements such as Firearms qualifications.

CRIME SCENE TECHNICIAN/DETECTIVE'S RESPONSIBILITIES

Duties of Officers and Supervisors until Forensics Arrives

Due to the sensitive nature of crime scene investigation it is imperative that certain steps are followed to maintain the integrity and preserve the crime scene. General Order 7-3 outlines the duties of the first officer on scene, assisting the victim, protecting the crime scene, securing witnesses, the duties of the first supervisor (along with the Detective Sergeant and Forensic Sergeant) on scene, duties of the investigator, and the duties of the forensic investigator.

Road Call Assignments

The Forensics personnel on-call will respond to a crime scene:

- When requested by a supervisor on scene.
- When requested by a Major Crimes Detective
- Any other call-out at the discretion of Forensics personnel.

Basic Steps for Crime Scene Personnel

- Approach the scene
- Secure and protect the scene

- Preliminary survey
- Narrative description (notes)
- Photograph scene and evidence
- Still photography
- Digital photography
- Video tape
- Sketch scene
- Evaluation of fingerprint evidence
- Evaluation of physical evidence
- Detailed search
- Collection, recording, marking, and preservation of evidence
- Final survey to insure conditions of crime scene are thoroughly documented
- Release crime scene
- Identification of victims, in order to make timely next of kin notification in situations where a death has occurred.

Mobile Scene Report

This form must be compiled on the Detective's or Technician's first tour of duty after completing any road call assignment.

EVIDENCE PROCESSING AND SUBMITTAL

- All items recovered from the crime scene are processed in the Richmond Police Forensic Laboratory or properly packaged and delivered to the State Laboratory for further testing.
- Evaluate items for latent prints and process for same. All firearm, trace, forensic biology, etc. are packaged according to DCJS and Virginia Division of Forensic Science guidelines and Submitted with Form DFS-70-001 "Request for Laboratory Examination" (RFLE). This evidence is to be submitted and the evidence picked up by the lead forensic detective assigned to the case to keep the chain of evidence to a minimum. If a large number of items are being submitted to the State Laboratory for analysis, a collaborative meeting/conference will be held to determine what items are the most probative for the first submission.
- The meeting/conference will include the lead detective, the assigned Commonwealth Attorney, and a supervisor from the Department of Forensic Science. The attendees will work in partnership and jointly decide which items are submitted to the State Laboratory.
- Prior to submitting items to the State Laboratory, a Xerox copy of the RFLE must be made and placed in a file in the office of the Forensic Unit supervisor.
- When the written response from the State Laboratory is received, a copy is to be placed in the file with the copy of the original.

SUBMISSION GUIDELINES FOR STATE LAB

- Please specify your agency's name and your agency's/precinct's address where you want the report sent.
- When mailing evidence, please place the Submission Form (RFLE) inside the mailing container but outside of the evidence container (see previous page for instructions). This assures that the evidence security is not compromised during the receiving process.
- Place an agency phone number rather than a home phone number on the submission form. This will allow the analyst to contact you if there is a question. An agency phone number assures that someone is available to at least take a message and contact you. If available, include the e-mail address and a pager # for the primary investigator assigned to the case to ensure quick communication.
- Type or print legibly with a ballpoint pen on your request form. This form is used to relay information which is rendered useless if the analyst can't read it.
- PLEASE USE JURISDICTION NAME to indicate jurisdiction of offense.
- DO NOT USE FIPS CODE or ORI #.
- Indicate the court date and the type of court (ie: District, Circuit, etc.). Do not indicate preliminary or arraignment dates.
- Clearly describe the type of evidence container and the item(s) being submitted.
- Use one item number for each item of evidence submitted under a FS Lab number. If resubmission of the item of evidence is required, reuse the item number originally assigned to the item of evidence. Do not duplicate item numbers that have already been assigned in a previous submission
- Each item listed as being in the evidence container must have an item number which corresponds with item numbers written on the RFLE. If not, DFS will assign item numbers
- Latent print cards, which are often carried in by hand, must be properly packaged, sealed and protected
- Evidence containers must be at least 5x7 inches in size to accommodate the DFS bar code label that is attached to the container for tracking purposes
- Each evidence container should include the following MINIMUM information, agency case number (if available), the item number and a description of the item
 - Agency case number
 - Item number
 - Item description
- A secure seal is necessary for chain of custody. However, do not tape excessively. This makes evidence handling in the laboratory difficult.
- Evidence Seals: An acceptable seal is one that prevents ready escape of the evidence and will be clearly damaged or altered if broken to permit entry. Intact manufacturer seals do not need to be resealed with additional tape. Personnel sealing evidence must place their initials or mark on, across or under the seal.
- Envelope flap / bag sealed with tape and initialed
- Intact manufacturer seals
- No tape required
- When submitting evidence in a cardboard box (i.e. gun boxes) and a Trace or Forensic Biology examination is being requested, seal all openings where evidence may readily escape.
- Box openings sealed with tape

- Zip tie through perforated holes sealed with tape
- Have the FS Lab number available when picking up or checking on a case.
- If a case becomes inactive either by refusal to charge, dismissal, or plea agreement, contact DFS. This will allow DFS to prepare the submission to be returned to the agency.

PAPER EVIDENCE FOLD

Properly folded, the paper evidence fold is a leak proof container that may be used for small quantities of any dry substance such as hairs, fibers or powders that may leak from envelopes or paper bags.

Directions

1. Fold a clean, unused sheet of paper into thirds and place evidence in middle section
2. Fold one third over middle section
3. Fold the other third over middle section
4. Fold in half in the same direction as the thirds were folded. **THIS IS THE CRITICAL STEP IN MAKING THE PACKAGE LEAK PROOF**
5. Fold the ends up, making one into a point for easier insertion into the other
6. Insert the pointed end into the **OUTERMOST** opening of the straight end
7. If more than one evidence fold is to be placed into a larger container, each should be labeled to describe its contents.
8. The evidence fold should then be placed into a 5" x 7", or larger, envelope or paper bag which is labeled and sealed as indicated on page I – 7.
9. If it appears the final fold may not stay closed, use **ONE** small piece of tape to secure the closure

FINGERPRINT EVIDENCE

A fingerprint is an impression of the friction ridge pattern of the fingers left on a surface. Friction ridges are the lines that form patterns on the fingers, palms, toes, and sole of the feet, which are used for gripping. Ridge patterns form during fetal development and do not change from birth to death, although they may be altered. Fingerprints are unique and therefore the most positive means of identification.

Types of prints left on surfaces:

Latent fingerprints – friction ridges contain rows of pores that excrete perspiration. Perspiration is composed of 98% water and 2% salts, urea, amino acids, etc. When items are touched the impression of the friction ridges are left on the surface. Latent fingerprints may need to be enhanced to be visible. Therefore items in question should not be handled prior to processing.

Plastic fingerprints – Impression of the friction ridges left on a pliable surface – such as wax, soap, or butter. Plastic fingerprints are visible.

Patent fingerprints – Fingerprints left on a surface once friction ridges come into contact on other mediums such as blood, dirt, grease, etc. Patent fingerprints are visible.

Developing, Lifting, Labeling and Preserving Latent Fingerprints

The development of latent fingerprint evidence is a crucial part of many investigations. Surfaces and items that may hold fingerprint evidence should be handled with great care. There are many factors involved in depositing and subsequently developing latent fingerprints. These factors should be considered when determining the correct method for processing the item/area. Processing a surface for fingerprints is the last process to be done after all evidence is collected to avoid contamination.

Fingerprint Powders

Fingerprint Powders are the most common tools used to develop latent fingerprints. The powders adhere to moisture in the latent fingerprints and work best on smooth non-textured surfaces. Once fingerprints are located they are lifted using transparent tape and placed on a backing card.

Chemical Development

There are numerous chemical products available for use. These options should be considered when dealing with difficult surfaces and older evidence.

- Ninhydrin- contains ninhydrin crystals, alcohols, and petroleum ether. It reacts with the amino acids in the fingerprint residue. Heat is used to accelerate latent development. Ninhydrin is used on porous surfaces such as paper, cardboard, and money. Once fingerprints develop the item is placed in plastic.
- Cyano acrylate (superglue) – reacts with water, fatty constituents, and other components in the fingerprint. The fumes polymerize the ridge detail creates a hard whitish deposit. It can be used on nonporous surfaces such as guns, plastic bags, etc. Fingerprints can then be photographed or further enhanced with fluorescent dyes or an alternative light source.
- Fluorescent Dyes- used after the cyano acrylate process to enhance the detail of the fingerprint making it readily visible.

Collection and Submission

After the fingerprint has been developed using the above techniques it must be documented, recovered, and submitted to AFIS. Depending on the circumstances the fingerprint will either be photographed or submitted per Forensic Unit Directives or the following procedure will be initiated:

1. Fingerprint backing cards will show the date collected, IBR#, offense type, address, where latent was lifted, name of technician who lifted the card and their code number. Space is provided to draw a sketch on the back of the card if needed. Forensic technicians will also place their initials over the lifting tape and indicate the direction of the print if applicable.

2. All fingerprint cards/latents will be placed in an envelope before delivery to the Forensics Unit. All pertinent case information including type of offense type, location, processed by, offense date, date processed, offense report number, and suspect name will be marked on these envelopes. Provide additional information such as “second submission” or “evidence may be related to another crime scene” whenever possible. When the fingerprints are submitted to the forensics unit they are assigned a latent number and a determination is made if there is any value or not. If there is value then the latent prints are run in AFIS. If a possible match is made then a direct comparison is done between the suspect print and a master fingerprint card. Fingerprints are also sent to the Virginia Department of Forensics for analysis in their latent section.
3. All fingerprint evidence that is collected by the Forensic unit will be documented in a crime scene search report then submitted to the latent fingerprint section. Patrol or detective units will document any latent evidence collected in their own respective reports. This will be done either in an IBR report or in a detective’s case summary.

Known Samples

Known fingerprints and palm prints will be collected when latent fingerprints are recovered as evidence from the crime scene when possible. These fingerprints should be rolled on the fingerprint card. Name of individual will be printed on the elimination card as well as their signature. The forensic technician/detective rolling the prints will also sign and date the card. Indicate the person’s relationship to the crime scene on the back of the form (example: victim, resident, witness, officer at scene).

Other issues related to known samples (sources) that will need to be considered when collecting evidence are those cases that deal with hair, fibers, fabrics, paint, glass, wood, soil and tool mark evidence. In these cases, the Forensics Unit should be responsible for collection a sample from a known sample to accompany any evidence for laboratory comparison or examination.

BIOLOGICAL EVIDENCE

Biological evidence found at a crime scene has become a very valuable tool as it relates to crime scene investigation. Biological evidence recovered from a scene has the potential to contain DNA. DNA-Deoxyribonucleic Acid is the fundamental building block for an individual’s entire genetic makeup.

- It is a component of virtually every cell in the human body
- DNA is the same in every type of cell
- DNA is unique to every person except twins

Because of that difference DNA collected from a crime scene can link a suspect to the evidence or scene, link a victim to a suspect, link a victim to the scene or eliminate a suspect. Just as in fingerprints, DNA recovered from multiple crime scenes can link the same suspect locally, statewide or nationally.

The human cell contains two parts where DNA can be recovered, the nucleus and the mitochondria.

- Nuclear DNA is located in the nucleus part of the cell, and is found in substances such as sweat, blood, saliva, semen and skin.
- Mitochondrial DNA located in the mitochondria of the cell, found in bone, hair, and teeth. Mitochondrial DNA is located in a higher quantity in the cell than Nuclear DNA. mtDNA is inherited strictly from the mother, and will match remains to maternally-related individuals. It is very useful when the sample found is very old, also in missing persons or found remains cases.

Training

Collection of evidence for laboratory analysis should only be done by Forensics Unit personnel or other trained Department personnel. In the case of DNA evidence collections, this should only be performed by personnel who have been specifically trained in that area. All personnel responsible for recovering DNA evidence will be required to attend documented training on the proper techniques for evidence recovery and preservation.

Safety Precautions

Biological evidence must be handled with universal precautions, treat every item as if it were contaminated.

- Wear gloves and change them when handling different pieces of evidence
- Appropriately mark the packages “Biohazard”
- Avoid hand to face contact and wash hands immediately after handling evidence
- Use disposable equipment if possible, if not make sure the equipment is properly sanitized with a bleach water solution

Identifying DNA

DNA can be collected from virtually anywhere, including non-traditional sources. Examine the probative value of potential evidence. As discussed earlier Nuclear DNA can be found in sweat, blood, skin and saliva. Refer to the chart below as a guide:

Evidence	Possible Location of DNA on the Evidence	Source of DNA
baseball bat or similar weapon	handle, end	sweat, skin, blood, tissue
hat, bandanna, or mask	inside	sweat, hair, dandruff
eyeglasses	nose or ear pieces, lens	sweat, skin
facial tissue, cotton swab	surface area	mucus, blood, sweat, semen, ear wax
dirty laundry	surface area	blood, sweat, semen

toothpick	tips	saliva
used cigarette	cigarette butt	saliva
stamp or envelope	licked area	saliva
tape or ligature	inside/outside surface	skin, sweat
bottle, can, or glass	sides, mouthpiece	saliva, sweat
used condom	inside/outside surface	semen, vaginal or rectal cells
blanket, pillow, sheet	surface area	sweat, hair, semen, urine, saliva
"through and through" bullet	outside surface	blood, tissue
bite mark	person's skin or clothing	saliva
fingernail, partial fingernail	scrapings	blood, sweat, tissue

Collection and Preservation

DNA evidence needs to be properly air dried to prevent the growth of bacteria. Bacteria growth can destroy genetic material and potentially interfere with testing. In order to further protect potential DNA evidence, ensure that the items of evidence are kept out of direct sunlight and extreme heat. In order to ensure air drying of your item occurs, package the item in paper or boxes. Plastic should only be used as a temporary measure, if there is a concern of contamination through saturation. The Forensic Laboratory also has a blood room for drying evidence and containing separate drying chambers to prevent cross contamination.

Cross Contamination

Cross contamination can easily occur if the collecting officer is not cautious. Cross contamination occurs when DNA from one source comes into contact with another place, person or item of evidence. To avoid this, here are a few simple guidelines.

- During the collection of items, ensure that stained areas of an item do not come into contact with an unstained area of the same item.
EX: A shirt should not be rolled so that blood can contaminate other areas of a shirt. A barrier should be placed such as paper or cardboard inside as well as over and under the garment
- Other officers' DNA can contaminate biological evidence. Do not allow other officers to spit, smoke, drink or eat in a crime scene
- Change your gloves often, especially when handling different items of evidence.

Preservation

Once an item has been properly packaged, you must ensure that it is preserved in such a way to protect the DNA material.

- DO NOT allow items to stay in the heat or direct sunlight
- DO NOT allow wet items to remain in plastic packaging, air dry them as soon as possible

- DO NOT allow separate items of evidence to come into contact with other pieces of evidence or persons

At times, especially prior to latent fingerprint recovery, it is necessary to try to retrieve DNA from an object. This is done through swabbing. Whether you are swabbing the mouth of a bottle or can, or the trigger of a handgun the same precautions should be taken. When you are unable to recover an object due to the size or permanent position, swabs can be taken to attempt to recover DNA; areas may include steering wheels, doorknobs and visible stains located on surfaces or the ground. The following is the procedure for recovering swabs of evidence or surfaces:

- With gloved hands, place two drops of distilled water on a cotton applicator, if the area is dry. If the area is already wet, no distilled water is necessary
- With a necessary amount of pressure rub the area with the cotton applicator; ensure complete saturation of the entire applicator.
- Place the stained applicator in a swab carton.
- Label the carton with case information, location of where the swab came from, time and date
- Place the carton in a 5x7 envelope and label with an evidence tag, mark as “biohazard” if applicable.

Elimination Samples

When evidence is recovered for DNA analysis more than one genetic profile often exists. To help the lab further establish identity there is a need to recover elimination DNA samples, in the form of a Buccal swab. Buccal swabs are named for the buccal cell located in the inside of the cheek. Buccal swabs are easy to recover and can be done anywhere.

- With gloved hands, gently swab the inside of your subjects’ cheek; swabs of both sides can be packaged together.
- Place the stained applicator in a swab carton
- Label the carton with case information, and subject’s name, birthday, race, and sex.
- Place the carton in a 5x7 envelope and label with an evidence tag

Type of lab examinations

Cases involving potential blood samples

- Is it blood?
- Is it human?
- What is the genetic profile of the stain?

Cases involving other potential samples

- Is there DNA present?
- What is the genetic profile of the stain?

Genetic typing is commonly referred to as “DNA analysis, and the process used by the lab is referred to as PCR, Polymerase Chain Reaction.

- Requires a small stain size
- Can analyze degraded samples

- Results can be searched in the Virginia DNA data bank

The Virginia DNA data bank is a collection of DNA profiles of convicted offenders. Buccal swabs are collected from every person convicted and/or arrested of certain felonies. The samples collected from scenes are cross-referenced with samples in the databank. If the offender is in the system, this is considered to a “hit”.

Laboratory Limitations

Due to large numbers of submissions to the lab, the lab will not analyze DNA evidence from misdemeanor cases and simple possession charges. Furthermore cases that require submission of “touch DNA” evidence to include swabs of doorknobs and steering wheels will need authorization from the Commonwealth’s Attorney’s Office prior to the lab examining **with the exception of crimes against persons cases**. Evidence recovered at a scene should have strong probative value and not be mere conjecture or guess as to its relevance to a case.

All submissions for DNA analysis by the Richmond Police Department will be submitted to the Virginia Department of Forensic Science Laboratories, which is accredited by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASC:D:LAB).

DOCUMENTING THE CRIME SCENE

Photography and Video Taping

The purpose of photographing the crime scene is to provide a permanent visual record of what occurred at a crime scene prior to, during, and after the commission of an offense, to aide in reconstructing the crime scene at a later time and refresh memory, substantiate testimony, and clarify understanding. Crime scene photos should depict the placement and significance of physical evidence in order to convey to a jury the circumstances of the crime.

Photographs must be accurate, authentic and relevant to be entered as evidence in court proceedings. Photographs and video taping should be complete pursuant to the collection of evidence and should depict the following:

Over all Photos:

General photographs of crime scene. Photograph as soon as possible, preferably before anything is disturbed and anyone is allowed into the scene. A grayscale marker or template should be photographed to establish the location and pertinent case information.

Midrange Photos:

Link between overall and close ups photos showing relationship of pertinent evidence. These photographs should be taken from a natural perspective.

Close up Photos:

Photographs of individual items of evidence with and without a ruler and evidence marker

Crime Scene Sketching

The purpose of crime scene sketching is to fill the gap between photos and written notes in order to document the placement of evidence and illustrate dimensions and features of the area.

Crime scene sketches are usually performed for more serious offenses to include homicides, malicious assaults and police-related shootings.

Crime scene sketches are done in three stages to include a rough sketch which is initiated at the scene, an intermediate sketch which is a more refined version of the rough sketch and a final sketch, this sketch is either hand drawn with stencils or created on the computer using the crime scene sketch program.

The rough sketch will document with accurate measurements the locations of pertinent evidence, overall dimensions of the area, and any other relevant objects. The intermediate sketch will depict a clear and accurate view of the crime scene. The sketch should be drawn using a standard scale. The *legend* of the diagram will document the following information:

- Name (drawn by)
- Date and type of offense
- IBR number and address
- Compass direction

Under the heading *key* will be a numerical listing of evidence included in the diagram. Item numbers should correspond with those numbers indicated on the crime scene search report. *Symbols* will appear under a separate heading to clarify characters used in the diagram. Items of evidence that were not measured at the crime scene should not be depicted in the scale drawing.

The final sketch is usually completed at the request of investigating officer or Commonwealth Attorney for the purpose of court presentation. This version of the diagram is usually produced on a larger format and may require services to be rendered outside the unit.

Mobile Crime Scene Reports

A Mobile Crime Scene Report will be completed to document all work done at the crime scene by Forensic Technicians and/or Detectives. The report will include date and time of arrival, description of photographs/videotapes, examinations conducted, and any evidence recovered.

Crime scene search reports will also include a complete and detailed account of actions performed at the crime scene and/or the forensic lab. Check the appropriate box(s) showing the type of fingerprint procedures used, the types of trace evidence collection used, and the type of field test kits used. The report will include a list of items processed at the crime scene and at the forensic lab to include items with latent fingerprints found and items in which no latent fingerprints were found.

There will be a complete list of all items collected as evidence. The list will include item number, date of recovery, time of recovery, and handling, which will consist of any type of processing done on said item.

When describing evidence recovered from a crime scene, technicians will refer to the Virginia Division of Forensic Science Evidence Handling Guide for definitions. For all offenses involving the recovery of a stolen vehicle the vehicle information will be placed in the field assigned for that information. In all other offenses involving vehicles the information must be included in the report but may be placed in another field. All reports will include a brief description of the photographs, the number of latent cards lifted and whether or not elimination prints were taken.

All Crime Scene Search Reports must be done completely in a timely manner and are subject to review by a Forensics supervisor. The crime scene search report must be thorough, accurate, and legible.

COURTROOM AND CASE PREPARATION

- Prepare case folders for court and update case management.
- Prepare all sketches of crime scene (enlarged and to scale).
- Prepare latent display boards if applicable.
- Ensure all items of evidence have been submitted, tested and prepared for courtroom display.
- Ensure that all labs have been submitted to the court within the statutory time frames.
- Meet with the Commonwealth's Attorney to review the case for court.

DAILY ARREST AND FINGERPRINT DUTIES

Retrieve arrest packets from the Sheriff's Office

- Check computer to determine repeat offender arrests.
- Separate repeat offender arrests.
 - Retrieve fingerprint cards from master file.
 - Compare new arrest print card with card from master file.
 - Insert OCA and SID numbers onto arrest sheets.

Log and update all information into PISTOL system.

- For first time offenders, assign the next available OCA number and insert onto arrest sheets and accompanying cards. Log all information onto Data General Program and PISTOL system.

- All arrest sheets are then delivered to Data Operations.
- Re-file all fingerprint cards in appropriate locations.
- Maintain and update daily record of arrest packets processed, recording number of repeat offenders, number of first time offenders, and last O.C.A. number assigned.

Other duties associated with the Daily Arrest and Fingerprints Duties are:

- Identifying alias names, check arrested party for outstanding warrants under alias names, immediately notify the Sheriff's Office
- Compile "Alias Name - Fingerprint Match" form and forward to original arresting officer.

Automated Fingerprint Identification System (AFIS)

Only persons assigned an AFIS Operator ID and password by the State Operations Committee shall have access to the AFIS equipment. All AFIS operators shall follow established AFIS Procedures. They shall operate the equipment in accordance with the instructions provided by the State AFIS personnel. Forensics personnel assigned operator IDs and passwords are responsible for the following functions utilizing AFIS: latent processing, ten print processing, palm print processing, inputting palm prints and applicant cards. Forensics personnel utilizing AFIS are responsible for following all reporting procedures set forth by the Commonwealth of Virginia regarding reporting hits on the system.

CRIME LABORATORY DUTIES

Latent Print Processing

It is the responsibility of the assigned Forensics personnel to retrieve and process property from the Property Room that has been submitted as evidence to be examined for latent prints. After processing evidence, results will be logged in the fingerprint log book. Latent prints will be files in the proper file and forms to notify submitting officer of examination results shall be completed. This will be placed in PISTOL under the Case Management Forensic Folder and evidence shall be returned to the Property Room.

Latent Fingerprints

- All latent fingerprints must be submitted to the Forensics Unit in drop box located in the Headquarters Mailroom.

- The Latent Print Examiner will examine the latent fingerprints to determine whether they are of such quality that will allow them to be entered into AFIS (Automated Fingerprint Identification System)
- If the fingerprints can be entered into AFIS, the Latent Print Examiner will enter them into the system. A copy of the examination form will be placed in PISTOL under Case Management-Forensic Folder.
- If the Latent Print Examiner determines the latent fingerprints are comparable quality but not of sufficient quality to be entered into the AFIS system, they will be filed within the AFIS Room. Upon receiving the fingerprints, the Latent Print Examiner will note same in PISTOL Case Management-Forensic Folder.
- If the Latent Print Examiner determines the latent fingerprints are not of comparable quality, it will be noted in PISTOL, Case Management-Forensic Folder. The card will be kept for a period of three years and then destroyed.

COMMONLY USED FORENSIC TESTS CONDUCTED THROUGH THE STATE LAB

DNA Collection and Submission

Virginia DNA Data Bank

If the DNA profile obtained from the evidence does not match the known sample from the suspect or no suspect sample has been submitted for comparison, the DNA profile obtained from the evidence will be searched against the Virginia DNA Data Bank (also known as CODIS) to help identify the possible perpetrator of the crime.

Criminal Paternity/Maternity

The Forensic Biology Section performs DNA analyses in cases involving incest or rape in which the victim of the assault gives birth to a child and the known blood or buccal samples from the victim, suspect and child are submitted to the laboratory for comparison. In addition, DNA analysis can also be performed on fetal tissue obtained as a result of an abortion once the known samples from the victim and suspect are submitted to the laboratory.

COLLECTION GUIDELINES

Biological fluids and body fluid stains are valuable evidence which can be used to either associate a victim or suspect with a crime/crime scene or eliminate them from consideration. The most frequently encountered biological fluids are blood, seminal fluid, and saliva.

SAFETY PRECAUTIONS

It is imperative when collecting or packaging biological evidence for submission to the laboratory that clean latex gloves, shoe covers, gowns, masks, head covers, and safety glasses, as appropriate, be worn and changed often. All biological materials and fluids must be handled with universal precautions. Body fluids, wet or dry, have been shown to carry diseases, so proper safety precautions must be observed. Dry stains may flake when disturbed or collected, sending

minute particles airborne. These may be absorbed through mucus membranes (eyes, nose, mouth, etc.), open cuts, or chapped skin.

ITEM - BIOLOGICAL EVIDENCE

METHOD - All biological evidence should be air-dried prior to submission to the laboratory. When possible, the evidence (once packaged) should be submitted to the laboratory as soon as possible. If the evidence cannot be dried and submitted to the laboratory the same day as packaged, refrigerate the evidence until submission. However, the evidence should not be refrigerated for more than a week. During the collection, air-drying, or packaging of any body fluid stains, caution should be used to ensure that a stained area from an item of evidence does not come in contact with another stained or unstained area. This applies to outer surfaces and inner surfaces. For example, a shirt should not be folded or rolled so that bloodstain on the front contaminates any stained or unstained area on the back or inside of the shirt. A barrier, such as paper or cardboard should be placed on the inside of the shirt, as well as under and over the garment to prevent stained areas from coming in contact with each other. When air drying articles stained with body fluids, place them on or over a piece of clean paper. Any debris which falls from the material onto the paper during the drying process will be collected when the paper is folded with the article prior to packaging, labeling and sealing. Body fluid evidence can be contaminated by the crime scene officer's own body fluids. The perspiration on the officer's hands may contaminate the cotton swabs used to collect the body fluids. To prevent such contamination protective clothing (i.e., latex gloves, gowns, masks, and head covers) should be worn while collecting the evidence. To avoid possible sample-to-sample contamination, change latex gloves (and other applicable protective wear) as necessary when collecting evidence.

DISCUSSION - Refrigerating the evidence will retard bacterial growth. However it will not stop the growth which can then lead to degradation of the biological material if the evidence is not dried. The sooner the biological evidence is dried or submitted to the laboratory for drying, the more likely useful information can be obtained from the evidence through DNA analysis.

ITEM - WET (SATURATED) BIOLOGICAL EVIDENCE

METHOD - Package the item of evidence in plastic only if there is a danger of contamination due to saturation of wet items that cannot be air-dried prior to submission to the laboratory. Paper packaging is preferred if saturation is not a problem. **NOTE:** If it is necessary to package an item of evidence in plastic because it is wet, this information needs to be indicated on the RFLE and the evidence submitted to the laboratory the same day as packaging, if possible.

DISCUSSION - Within a short period of time wet evidence stored in plastic, even if refrigerated will promote bacterial growth, which can destroy biological material and potentially preclude the examiner from obtaining DNA results.

ITEM - KNOWN BLOOD/BUCCAL SWAB SAMPLE

METHOD - Known blood samples are taken by a doctor, nurse, or other qualified person and collected in a 7cc lavender top EDTA vacutainer tube. **NOTE:** Collect blood for alcohol and/or

drug analysis separately and according to instructions in the Toxicology Section of this manual. Known buccal swabs are collected by taking two (2) sterile swabs and swabbing the inner cheek of the mouth. The swabs should be rotated during the collection process to ensure that the swab has been saturated with saliva and buccal cheek cells. Place both swabs together into one new labeled swab box to air dry.

ITEM - WET BODY FLUIDS ON NON-POROUS SURFACES (i.e., glass window, counter top, wood floor, etc.)

METHOD - Absorb the stain onto a sterile cotton swab; saturating one swab before using another. Use the minimum number of swab(s) to collect the stain. Allow the swab(s) to air dry or place the swab(s) in a new labeled swab box for drying. It is not necessary to collect more than 4 saturated swabs for submission to the laboratory. NOTE: double-tipped swabs and Q-tips should not be used.

DISCUSSION - Collection of wet body fluids in this manner assures that the best evidence is submitted in its most concentrated form. Anytime water is added for collection, the chance of diluting the stain or contaminating the evidence is increased.

ITEM - WET BODY FLUIDS ON POROUS SURFACES (i.e., blanket, carpet, untreated wood, etc.) METHOD - Submit the air-dried item of evidence if possible. For large items (large carpets, upholstered furniture, etc.) it may be necessary to cut out the stained areas or swab the stained area with a sterile swab. If cuttings/swabbings are taken, package the cuttings/swabbing from each area separately.

ITEM - DRIED BODY FLUIDS STAINS [blood/semen] ON NON-POROUS OR POROUS SURFACES

METHOD - Submit the item of evidence or when possible take a swabbing of the evidence and submit the swab(s) to the laboratory. For large items (large carpets, upholstered furniture, etc.) it may be necessary to cut out the stained areas or absorb the stained area onto a slightly moistened sterile cotton swab using one (1) to two (2) drops of distilled water. Saturate one swab with the stain before absorbing onto the next swab. Allow the swab(s) to air dry or place the swab(s) in a new labeled swab box for drying. It is not necessary to collect more than 4 saturated swabs for submission to the laboratory. NOTE: double-tipped swabs and Q-tips should not be used.

DISCUSSION - Avoid scraping crusts due to risk of airborne flakes.

ITEM - DRIED BODY FLUID STAINS [saliva/perspiration] ON NON-POROUS OR POROUS SURFACES (i.e., bottles, cans, triggers or grips of firearms, etc.)

METHOD - Submit the item of evidence or when possible use a single swab to take a swabbing of the evidence and submit the swab to the laboratory. It may be necessary to absorb the stained area onto a slightly moistened sterile cotton swab using one (1) to two (2) drops of distilled

water. Allow the swab to air dry or place the swab in a new labeled swab box for drying. NOTE: double-tipped swabs and Q-tips should not be used.

DISCUSSION - Avoid scraping crusts due to risk of airborne flakes. A single swab is recommended for collection to concentrate the stain and to increase the likelihood of obtaining sufficient biological material to obtain a DNA profile. By swabbing an item of evidence, such as the mouth of a bottle or an area of the grip of a firearm of no value for latent print examination, the swab(s) can be submitted to the Forensic Biology Section while the actual item of evidence can be submitted for examination to the Latent or Firearms Sections. If uncertain where to collect the swabbing it is best to submit the entire item of evidence to the laboratory for evaluation. The Forensic Biology Section no longer analyzes control swabs, therefore there is no need to collect or submit a control swab to the laboratory.

ITEM - BODY FLUID EVIDENCE NOT READILY VISIBLE

METHOD I - An Alternate Light Source (ALS) may be used to locate a possible biological substance (i.e., seminal fluid). Once the stain has been located, the stain(s) can be collected and submitted to the laboratory.

Examples of ALS:

- UV light
- Omnichrome
- LumaLite/ CrimeScope
- Short wave and long wave ultraviolet light: No filter is needed when using UV light, short wave UV light is emitted at 245 nm and long wave UV light is emitted at 366 nm. NOTE: long term exposure of DNA to UV light can cause degradation. Omnichrome: fluorescence of body fluids is best at 450 nm; a yellow filter should be used.
- LumaLite/CrimeScope: most sensitive of the Alternate Light Sources and can be used in daylight; fluorescence of body fluids is best at 450 nm; an orange filter should be used.

DISCUSSION I - At certain wavelengths of light, body fluids may emit light (fluoresce). This can be demonstrated by holding a UV light source over a particular item of evidence with suspected body fluid staining. For example, seminal stains on automobile seats and floors may not be readily visible to the naked eye but may be enhanced by using an ALS. Certain chemicals (such as detergents) can mimic body fluid stains under certain lighting conditions.

METHOD II - Luminol or the BlueStar® Forensic Test Kit can be used to visualize traces of blood from a crime scene that has been cleaned up and residual blood still remains that cannot be seen in natural light. The Luminol and BlueStar® reagents are chemiluminescent compounds which react with blood and emit light in a dark environment. Take a swabbing of Luminol or BlueStar® positive areas and submit to the laboratory for possible blood confirmation. If submitting a piece of evidence with a Luminol or BlueStar® -positive stain, circle the area where luminescence was seen. Luminol and the BlueStar® reagent are sprayed in the dark and the luminescence may be photographed with very sensitive film. Collect any visible stains. Do not over saturate the stain area, otherwise the Luminol or BlueStar® solution will dilute the possible blood stain.

DISCUSSION II - Luminol and the BlueStar® reagent can react with other substances such as metals and bleach.

ITEM - VICTIM PHYSICAL EVIDENCE RECOVERY KIT (VPERK) – white box A kit used for the recovery of physical evidence from the body of the sexual assault victim. Modifications to this kit are made for the collection of evidence from children and male victims.

METHOD - For use within 72 hours of the assault. Medical personnel are urged to follow the instructions supplied with the kit.

DISCUSSION - The kit contains supplies to recover foreign secretions and trace evidence (i.e., hairs and fibers) from the alleged victim. In addition, the kit contains supplies for the collection of known samples from the victim for comparison with the foreign secretions and hairs and fibers recovered which may be from the suspect. PERKS are available at all regional laboratories for law enforcement officers and hospitals. The kit should be sealed and initialed by the examining clinician/doctor and initialed by the officer receiving the PERK. Do not open and air-dry the contents of the PERK Submit the PERK to the laboratory the same day it is collected. If this is not possible, refrigerate the evidence up to one week before submission to retard bacterial growth and thus degradation process. The Evidence Transfer Bag should be left open since items inside have been sealed.

ITEM - SEXUAL ASSAULT VICTIM'S UNDERPANTS

METHOD - Submit underpants worn during and/or immediately after the assault if the examining clinician did not include them in the PERK.

DISCUSSION - Specifically ask if the underpants worn by the victim to the hospital are the same ones worn immediately after the assault. If not, it may be necessary to locate and collect them. Package them in paper to facilitate drying. The underpants worn by the victim immediately after the assault will likely collect vaginal drainage, which may include the seminal fluid, saliva, and/or hairs/fibers left by the suspect. Other victim clothing items may be submitted if the suspect had contact with them. If submitted, describe the clothing on the Request for Laboratory Examination form (i.e., bag containing blue jeans, shirt and sweatshirt).

ITEM - PHYSICAL EVIDENCE FROM SEXUAL ASSAULTS SCENE (i.e., bedding)

METHOD - If the assault occurred on a bed, collect the top surface of bed linen which may hold stains, hairs, and/or fibers. If the assault occurred in a vehicle, collect actual seat fabric cuttings and/or swabs of stains. Collect towels or tissues used by the suspect and/or victim to clean up after the assault; package in paper to promote drying. Swabs containing wet blood, seminal fluid, saliva, or distilled water used to moisten the swab MUST be:

- Air-dried or put in a swab box to dry, then submitted as soon as possible to the laboratory.
- Refrigerated until submitted to the laboratory. The evidence should be submitted to the laboratory within a week to reduce degradation.

- If the evidence has not been air-dried, this must be indicate this on the RFLE

DISCUSSION - These areas may contain body fluid and/or hairs/fibers of the suspect and/or victim. This becomes especially important if the victim has washed or cleansed himself/herself after the assault. Crucial evidence (i.e., trace evidence and biological substances) may still be obtained from clothing and bedding that has been washed. Therefore this evidence should still be collected for possible examination/evaluation if other evidence yields no probative information. Bedding can be submitted in the absence of a PERK. If a PERK has been collect, the bedding should not be submitted to the laboratory until the PERK has been evaluated.

ITEM - SUSPECT PHYSICAL EVIDENCE RECOVERY KIT (SPERK) - blue envelope A kit to aid the recovery of physical evidence from the body of a sexual assault suspect

METHOD - For use within 24 hours of the offense. Medical personnel are urged to follow the instructions supplied with the kit.

DISCUSSION - The kit contains supplies to recover foreign secretions (as may be found on underpants or pubic area swabs) and trace evidence (i.e., hairs and fibers) from the suspect's body and underpants. Also collect known samples (i.e., buccal swabs and hairs) from the suspect for comparison with foreign secretions and hairs and fibers recovered from the victim.

ITEM - SEXUAL ASSAULT SUSPECT'S CLOTHING

METHOD - Collect the suspect's clothing which was worn during the assault. Have suspect stand on large clean sheet of paper while disrobing to collect any possible trace evidence (i.e., hairs or fibers).

DISCUSSION - Secretions (i.e., vaginal fluid or saliva associated with fellatio), hairs, fibers, and/or other materials may be found on the suspect's clothing which may associate the suspect with the victim and/or the crime scene.

ITEM - BLOOD AND HAIR SAMPLES KIT/BUCCAL SWABS KIT – orange envelope

NOTE: The Blood and Hair Samples Kits are being phased out and will be replaced exclusively by the Buccal Swabs Kit. This kit is for the collection of known samples from a victim, suspect, or a third party for elimination purposes. This kit can be used when known blood and/or hair samples are to be collected for comparison purposes and are not collected elsewhere.

METHOD - The instructions supplied with the Blood and Hair Samples Kit or Buccal Swabs Kit should be followed when collecting the appropriate samples.

DISCUSSION - This kit may be used to collect evidence from the following individual under the specified circumstances:

- SUSPECT – when the collection of the samples takes place more than 24 hours after a sexual assault or any individual who may be involved in a particular criminal case.
- VICTIM - when the collection of known samples takes places more than 72 hours after a sexual assault or for cases not involving a sexual assault.

- **THIRD PARTY** - when an individual (e.g., husband or boyfriend) unrelated to the crime may have contributed biological substances to the evidence. The sexual assault may not be reported immediately; therefore it is imperative that the time interval since the assault occurred be determine to ensure the correct kit is used for the collection of the samples. The victim and suspect known samples must be collected and submitted to the laboratory for comparison with submitted evidentiary samples

ITEM - ABORTED FETAL TISSUE ASSOCIATED WITH CRIMINAL PATERNITY CASES

METHOD - If the fetus is 10 weeks old or more at the time of the abortion, request the medical doctor performing the procedure to place the entire aborted fetal material into a hard plastic container (i.e., specimen cup). If the fetus is less than 10 weeks old at the time of the abortion, request the medical doctor to isolate a portion of the fetal tissue from the maternal tissue and place the fetal tissue into a hard plastic container (i.e., specimen cup). Submit the container to the laboratory the same day. If it is not possible for the aborted fetal tissue/material to be submitted to the laboratory the same day, place the container into a refrigerator and submit to the laboratory the next day.

NOTE: The fetal tissue/material should not be stored in a saline solution or any other type preservative.

DISCUSSION - Within a short period of time fetal tissue/material stored in plastic, even if refrigerated will promote bacterial growth, which can destroy biological material and potentially preclude the examiner from obtaining DNA results. Tissue (products of conception) collected from an aborted fetus that is 10 to 12 weeks old may contain identifiable body characteristics (i.e., hands and feet) that can easily be isolated by the DNA examiner from the remaining aborted fetal/maternal tissue. If the fetus is less than 10 weeks old, the body characteristics cannot be easily identified by the examiner. Therefore assistance from the medical doctor performing the procedure will be required to isolate the fetal tissue from the maternal tissue prior to submission to the laboratory.

SUBMISSION REMINDERS

General Reminders

Requests for DNA analysis of “touch” evidence will not be accepted without a written request specifying the reason for such testing from the Commonwealth’s Attorney. A letter of request from the Commonwealth’s Attorney will not be required for the analysis of “touch” evidence in major crimes cases where screening by a DNA examiner as described in paragraph 2 below has occurred. Refer to the following memorandum addressed to all agencies served by the Department of Forensic Science Laboratories dated October 12, 2004. Prior to submission of a large number of items the examiner/supervisor must be contacted via telephone or through an in-person meeting to identify the most probative evidence for the respective case and evidence submission will be limited to those items. Refer to the following memorandum addressed to all agencies served by the Department of Forensic Science Laboratories dated October 12, 2004.

- Determination of probative evidence will be decided based on a number of factors including the type of case, the evidence collected, the number of victims and perpetrators, etc.
- In the event that additional evidence submission is necessary, communication between the assigned examiner and the investigator will occur to facilitate this process and the examination of the subsequent submission in a timely manner.
- DNA analysis of evidence associated with simple possession of controlled substances (i.e., cocaine, heroin) and misdemeanor offenses, except any sex-related offenses (such as peeping tom cases), will not be analyzed without a written request from the Commonwealth's Attorney specifying the reason for such testing. Refer to the following memorandum addressed to all Law Enforcement Personnel dated May 14, 2002. To perform a complete DNA analysis and reach a conclusion, it is imperative that all appropriate known samples (i.e., victim, suspect, elimination samples, such as the husband or boyfriend) are submitted to the laboratory prior to the DNA analysis of the evidence. Submit only the most probative item(s) of evidence to the laboratory. If necessary, additional items of evidence can be submitted at a later date.
- Prior to submitting evidence from a "cold case", please consult with the Forensic Biology Section examiner who performed the original analysis, if possible, or a section supervisor to determine which items of evidence should be resubmitted to the laboratory. If it is not possible to dry a wet item of evidence prior to submission to the laboratory, please indicate on the Request for Laboratory Examination (RFLE) form that the item of evidence is wet so that immediate attention can be given to this item and the sample(s) can be dried prior to storage.
- The Forensic Biology Section no longer analyzes control swabs, therefore there is no need to collect or submit the control swabs to the laboratory.

Physical Evidence Recovery Kit (PERK) Reminder

When preservation of the evidence is required, submit only those items that need to be preserved (i.e., Victim PERK). If both the Victim PERK and clothing have been collected and the clothing is dry, only submit the Victim PERK for preservation. Please specify on the RFLE that the request is for "Preservation Only."

GSR COLLECTION AND SUBMITTAL

Primer residue is formed by the ignition of a chemical in the primer when a firearm is discharged. This results in the formation of microscopic particles which are blown out of various openings in the weapon as the weapon is discharged. These particles are spherical or molten in appearance and typically contain the elements: lead, barium and antimony. Particles of this nature are highly specific to primer residue. Particles containing two of the three elements listed above are indicative of primer residue. Indicative particles are less specific to, but commonly found in, primer residue. Primer residue can be deposited on the hands by circumstances such as: firing a weapon, handling a weapon, being in the proximity to the discharge of a weapon or coming into contact with an object that has primer residue on it. The examination itself cannot determine the relative likelihood of these listed circumstances. The absence of primer residue on the hands is consistent with an individual not having fired a weapon. A negative result could also

occur from circumstances such as: washing the hands, wiping the hands, wearing gloves, sweating profusely, environmental factors including wind and rain, bloody hands, excessive debris on the sample, greater than 4 to 6 hours passing between firing and sampling, or the weapon not producing primer residue on the hands when discharged.

COLLECTION GUIDELINES

ITEM – Primer Residue from the hands

METHOD - Follow the specific instructions included in the primer residue (GSR) kit provided by the Department of Forensic Science. Always sample the hands of a suspect as soon as possible. Collect primer residue samples at the scene whenever possible. If collection at the scene is not possible then bag the hands of the suspect with Tyvek® or paper bags before transporting in a police vehicle.

Secure paper bags around the wrists of the suspect with rubber bands; secure Tyvek® bags around the wrists of the suspect with the attached drawstring of the bag. Always clean your hands before collection of samples. Grip the suspect's hand by the wrist and avoid touching the surface to be sampled. If sampling from a dead body avoid wet or bloody areas. Always wear barrier gloves. Always photograph the hands and document any high velocity blood spatter patterns if present before sampling for primer residue.

DISCUSSION – Primer residue particles are continually lost from the hands due to normal activity. The optimal window of opportunity for sampling the hands of a living individual lasts for up to 4 to 6 hours after the shooting event. The Department of Forensic Science will no longer routinely analyze primer residue samples collected from the hands of a living individual in excess of 8 hours after the shooting event. If exigent circumstances exist (individual was asleep or unconscious) indicate that on the Analysis Information Form contained in the collection kit provided by the Department of Forensic Science.

ITEM – Primer Residue from clothing

METHOD – Only samples collected from clothing that is similar to skin (leather, vinyl) will be analyzed.

DISCUSSION – Analysis of primer residue particles collected from clothing can be problematic for a number of reasons. There is no way to determine how long primer residue particles may remain on clothing. Studies have shown that clothing may retain primer residue particles even after washing. Fibers collected on the sampling device can cause problems during analysis. For these reasons, only samples collected from nonfibrous clothing will be analyzed for primer residue.

ITEM – Primer Residue from vehicles

METHOD – If a vehicle is suspected to have been used in a “drive by” shooting, samples can be collected to determine the presence of primer residue. Collection should be done from leather,

vinyl or plastic surfaces. Avoid sampling fabric surfaces. If the weapon was discharged inside a vehicle a good place to sample would be areas where small amounts of settled dust can be seen. Examples would include the top of the dashboard or steering column. Areas exposed to the wind from an open window are less likely to retain primer residue particles.

DISCUSSION – Use a single Primer Residue kit to sample the areas of interest. Simply strike out “right hand” or “left hand” and write in the area currently being sampled. It is not necessary to submit multiple kits from a single vehicle since it is not possible to determine the position where the shooter was firing from by primer residue analysis.

SUBMISSION REMINDERS

Fill out the Primer Residue Analysis Information Form as completely as possible and make a copy for your records. This information is used at the laboratory to maintain a database on primer residue cases and helps identify problematic ammunitions and weapons. An examination for primer residue should not be confused with a firing distance test. The distance from the muzzle of a weapon to the victim cannot be determined by testing for primer residue particles on the hands of the victim. Therefore, analyzing samples from the hands of homicide victims shot at close range is typically not probative.

FIREARMS/NIBIN

Mechanical Condition of Firearms

Each firearm that is submitted to the firearm section is examined to determine whether it is in normal mechanical operating condition and it is test fired, when possible. This examination includes the operability of the safety features, physical characteristics of the firearm and trigger pull. In addition, a drop test examination can be conducted to determine whether the firearm will or will not fire without pulling the trigger, when necessary. Also, capability of full automatic fire is determined.

NIBIN is a computerized system for acquiring and storing, in a database, the images of cartridge cases and shot shell cases from semiautomatic pistols and semiautomatic, slide-action and bolt action rifles and shotguns. After capturing an image, the system can correlate it for possible associations. A firearms examiner evaluates the correlation and if an association is found, the actual evidence is compared, by an examiner, on a comparison microscope for a final determination. With the utilization of the NIBINTM system, it is possible to help law enforcement agencies establish links between incidents.

Identification of Firearm Parts

Firearm parts found at a crime scene may be identified as to:

- The type of firearm from which they originated
- Whether the part came from an evidence firearm (Fracture Match)

Identification of Brand

Bullets, wad components, cartridge cases and shot shell cases recovered at a scene or from a body may be identified by brand.

Possible Brand and Caliber of Firearm

By determining the class characteristics (caliber, number of lands and grooves, direction of twist and their dimensions, breech face and/or firing pin shapes, other various markings) exhibited on fired ammunition components (bullets, cartridge cases, shot shell cases), the firearm examiner may be able to provide information concerning the brand and type of firearm which the component was fired. This may be particularly useful when no firearm has been recovered.

Bullet Identification to a Particular Firearm

When a rifled firearm is manufactured and through its use, unique microscopic markings (striae) are left on the inner surface of the barrel. When the firearm is fired, these striae are imparted on the bullet. These striae are individual to a particular firearm. When a firearm is submitted to the laboratory for comparison, the examiner test fires the firearm and uses a comparison microscope to compare the striae of the test fired bullet to those present on the evidence bullet. By this microscopic study of the markings on both bullets, the examiner can determine if the evidence bullet was fired from the submitted firearm. The following conclusions may be reached:

- The bullet was identified as having been fired from the firearm.
- The bullet was eliminated as having been fired from the firearm.
- It is not possible to identify or eliminate the bullet as having been fired from the firearm.

Firearm Not Recovered

Bullets and cartridge cases/shot shell cases recovered from the same or different incidents can be compared to determine if they were fired from/in the same firearm.

Bullet in Victim

If medical or legal constraints do not allow for the removal of a bullet, the laboratory may be able to determine the approximate caliber of the bullet using an x-ray technique. This may be helpful when several firearms of different caliber were used.

Bullet Fragments

The firearm examiner may be able to provide the same type of information from a bullet fragment as that of a whole bullet. A bullet fragment can be identified as having been fired from a particular firearm if sufficient marks are present. The quantity and quality of these marks are determined by microscopic examination. All bullet fragments should be collected and submitted to the laboratory.

Cartridges

If the cartridge has been cycled (loaded, extracted and ejected) through the action of a boltaction, lever-action, slide-action or autoloading firearm, the markings left by this process may be associated with a particular firearm. In some cases markings left on cartridges may be associated to a particular magazine. If these types of marks are present on cartridges, it may also be possible to associate them to cartridge cases, if no firearm has been recovered.

Cartridge Cases

Generally, there are five surfaces of a firearm that may leave identifiable marks on various areas of a cartridge case: breechface, firing pin, extractor, ejector, and chamber. Generally, if a fired cartridge case can only be identified to a particular firearm by the extractor and/or ejector mark(s), this only identifies the cartridge case as having been extracted and/or ejected (i.e., cycled) in a particular firearm.

Identification of Possible Brand of Firearm

By determining the class characteristics (caliber, type of breechface marks and firing pin shape) exhibited on a fired cartridge case, the firearms examiner may be able to provide information concerning the type and brand of firearm which fired the cartridge case(s). This may be particularly useful when no firearm has been recovered.

Shotshells

These may be associated to a firearm in the same manner as cartridges. The gauge may be determined and the brand of the components may be characterized.

Shotshell Cases

These may be identified in the same manner as a fired cartridge case. In addition, the components that may have been commercially loaded into the shotshell may be identified.

Shotshell Components

Recovered wad material and/or projectiles may be identified as to gauge, type, and/or brand of commercial manufacture.

Saboted Ammunition

A sabot is a plastic enclosure around a bullet/projectile that allows a smaller diameter and lighter weight projectile to be fired. The Remington Accelerator™ cartridge and sabot slugs (for shotguns) are two examples of this type of ammunition. When sabot ammunition is used, the microscopic markings from the barrel will be imparted onto the sabot rather than the bullet. This means the bullet/slug cannot be identified with the firearm that fired it, but it may be possible to identify the sabot.

Distance (Proximity) Determination

The approximate distance the muzzle of a firearm was from an object at the time of firing may be determined by examining clothing or other materials for the presence of gunshot residues. Pellet patterns can also be examined for approximate distance. When no firearm is recovered, objects can be examined for the presence of gunshot residues; however, unless it is a contact shot, an approximate distance *cannot be determined* unless a firearm and ammunition components associated with the firearm and the shooting incident are submitted. All ammunition recovered with a firearm should be submitted.

Reconstruction/Trajectory Analysis

The analysis of objects brought to the laboratory (such as a vehicle) or at the scene can be conducted to aid in the investigation for determination of trajectory and origin of the shots fired, help locate other pertinent evidence, and help determine the position of the victim and/or the shooter.

COLLECTION GUIDELINES

ITEM - Firearms (handgun or shoulder gun)

METHOD - All firearms to be submitted to the laboratory should be made safe. Unload firearms after properly documenting the cylinder in revolvers or the chamber and magazine in pistols, rifles and shotguns on a FIREARMS DOCUMENTATION WORKSHEET. A copy of this worksheet can be found on the last page of this section and should accompany all firearms being submitted. Consider recovery of DNA, trace or latent prints. (Do not process in field). Package firearms in a rigid container, seal, mark container and indicate condition of firearm on container as LOADED or UNLOADED. Firearms submitted for DNA or trace evidence must be sealed with tape over all edges and any openings (such as holes in the box) prior to submission (see example in General Submission of Evidence).

DISCUSSION - Safety is the first consideration; therefore, firearms should be unloaded prior to delivery to the laboratory. If this is not possible, call the firearm examiner prior to submission and make sure the packaging material is marked LOADED FIREARM. Packaging material may rub latent prints and destroy evidence; therefore, it is important to package in a manner so the gun contacts the packaging material as little as possible. Documenting the cylinder in a revolver may help determine the sequence of events and aid in scene reconstruction. If latent prints are not a concern, package in a rigid container with proper labeling. It is requested that you not package guns in plastic.

ITEM – Firearms found in water

METHOD – Place the firearm in a container of the same water and immediately submit the item.

DISCUSSION - When a firearm is found in water, leaving the firearm in the same water will slow the rusting process.

ITEM – Bullets, shot pellets, slugs and shotshell wads

METHOD - Recover using rubber tipped forceps or latex examining gloves, so as not to contaminate or add trace or other biological evidence. Place in a plastic zip lock type bag. Package projectiles separately, clearly label and seal properly. It is currently suggested not to mark the item itself. Bullets, etc. collected from doctors in the emergency room should be washed off with water (not disinfectants) prior to submission and air dried before packaging. Body fluids may destroy some microscopic markings.

DISCUSSION - Handling these items with your fingers may add additional trace or biological evidence. Bullets, etc. should be handled as if biohazards are present and in a manner to protect any trace evidence, such as fibers, paint or DNA, that may be present. The chain of custody can be maintained by marking the packaging material and carefully noting your actions.

ITEM - Cartridge, cartridge case, shotshell, shotshell case

METHOD - Recover using rubber tip forceps or gloves so as not to obliterate fingerprints, or damage trace evidence. Cartridges, cartridge cases, shotshells and shotshell cases may be placed in a zip lock bag if fingerprints are not a concern. Properly label and seal the container. If fingerprints are a concern, package in a manner that will immobilize the item and/or reduce the contact with the packaging material. Never mark the head stamp area or other portions of the cartridge, cartridge case, shotshell or shotshell case. In incidents where the use of sabot ammunition is suspected, the investigator should be aware that the sabot may have separated from the projectile (bullet or slug).

DISCUSSION - Handling these evidence items may destroy fingerprint evidence. The marks in the head stamp area and other portions are used in the laboratory comparison and identification process. Ammunition found at the scene or in the suspect's house may be helpful in the comparison process. The sabot bears the identifying marks (the bullet/slug in this instance does not).

ITEM - Clothing for gunpowder/gunshot residues

METHOD - Totally air dry clothing and package in paper so that the clothing is not contaminated. Place clothing item on flat piece of paper. Place a second piece of paper over the item and roll or leave in the flat position. Also place a piece of paper inside article of clothing. Properly label and seal the container. Also, please submit the autopsy report from the OCME, the police report, room size, onstraints, witness/suspect statements, and any information that may be pertinent to the investigation.

DISCUSSION - This packaging approach ensures that the area of the clothing bearing the gunshot residue will not come in contact with other areas of the garment. This is also a good procedure for bloody garments). Plastic will cause the biological material on the clothing to deteriorate, even if it is thoroughly air dried.

OTHER FORENSIC TESTING AVAILABLE THROUGH THE STATE LAB

- Blood Stain Analysis
- Trace (Other than GSR Testing)
- Drug Analysis
- Digital Evidence
- Tool marks
- Impressions
- Toxicology
- Questioned Documents

Note: REFERENCE THE VIRGINIA DEPARTMENT OF FORENSIC SCIENCE FOR GUIDELINES ON THESE TESTS.

EVIDENCE COLLECTION FROM OUTSIDE SOURCES:

- The Forensics Supervisor is responsible for the notification to assigned Detective/Technician for pick up of evidence from VCU Medical Center Trauma/Emergency Room.
- Medical Examiners Office.

PHOTOGRAPHIC LABORATORY DUTIES

PRINT AND PROCESS FILM AND DIGITAL MEDIA

- Process and print all film and Digital media submitted by Richmond Police Personnel, Metro Aviation and other agencies in support of Police Business.
- Provide Photographic coverage as needed to record Crime Scenes, Forensic Investigations, Media Relations and moral and welfare events.

OTHER PHOTOGRAPHIC LABORATORY RESPONSIBILITIES

- Ordering, stocking, and disseminating photo materials to all Richmond Police Personnel.
- Provide photographs for identification cards for all Police Officers, Commonwealth's Attorney's Office and Civilian Police personnel.
- Maintain photographs, negatives and digital media of all Police personnel.
- Maintain files of all negatives and digital media of photographs submitted to the Photography Laboratory.
- Adhere to maintenance schedule of all photographic development equipment.

Photographic Equipment Inventory

Photographic Studio (Portrait Equipment)

Digital and Film Photographic Printer
Color Film Processor
35mm SLR Film Cameras
SLR Digital Cameras
Point & Shoot digital cameras
Camera Lenses (variety of sizes)
Document & Photo scanners
Film scanners
Copy stands & Equipment

GENERAL OFFICE DUTY RESPONSIBILITIES

FILING OF LATENT PRINTS

All Forensic Personnel have the responsibility to collect, receive, log and file latent prints using the following procedures:

- All latent received must indicate the standard who, what, when, where, and why information along with the sector that crime occurred in.
- Latent prints received must be logged in the Fingerprint Log Book.
- Latent prints are assigned a consecutive number as they are logged.
- Latent prints from a single crime scene are to be placed in a manila envelope with proper information on envelope face, and placed in the proper file which is maintained in a strict numerical order.
- Latent prints removed from file for extended periods, such as court, should be replaced by a card of equivalent size with notations as to who has the latent prints, the date, and any other pertinent information.

LATENT PRINT COMPARISONS

- Upon receiving a request for a latent print comparison, any qualified member of the Forensic Unit shall fulfill the request.
- Upon completion of the print comparison, the Examiner will complete the "Latent Print Comparison Results" form in order to document official notification of the results and to convey any information that may be of value to the submitting Officer.

EXPUNGEMENTS OF ARREST RECORDS

- Upon receipt of a Circuit Court order, the record of the subject will be extracted from the files of the Forensic Unit
- The records consist of:
 - Master fingerprint card (white out date of expunged date).
 - Mugshot negative or image of expunged date.

- Any other records from expunged date.
- Delete file from Data General if it is the only arrest for the individual.
- Send a file correction form to Central Records or change the information in PISTOL depending on the circumstances.
- This should be done in a timely manner.

TRAINING

Personnel in the Forensic Unit go to a variety of training classes throughout the state of Virginia. The majority of this training is done at the Virginia Department of Forensic Science (Central Lab). Members of the Forensic Unit put in an application for the State Forensic Academy which is 9 weeks and covers the basics of crime scene investigation. This is done right when they start their career in Forensics and they are placed on a waiting list.

While waiting to attend the State Academy members of the unit go to week-long homicide training courses throughout the year that are offered through the Department of Forensic Science. Some members also attend the Chesterfield County Forensic Academy.

New members of the Forensic Unit are also trained by the current members of the unit and get a substantial amount of on the job training. They start the on-call rotation immediately and are trained by observing the current Forensic Detectives and Forensic Technicians.

Members of the unit that want to specialize in certain aspects of Forensics take specialized training classes to include, but not limited to, Advanced Latent Fingerprinting, Blood Spatter, and Firearms classes.

SPECIALIZED EQUIPMENT

The Forensic Unit is located on the 4th Floor of Police Headquarters at 200 W. Grace Street. The unit has its own Forensic Laboratory where Forensic Detectives/Forensic Technicians package evidence, fingerprint evidence, and swab evidence for potential DNA. The Forensic Laboratory also has a bloodroom for drying evidence and containing separate drying chambers to prevent cross contamination. The hazardous material is placed in biohazard bags and transported to property to be disposed by property personnel. The lab also has 2 hooded vents that are used to chemical process for fingerprints and when we store evidence from an arson.

In addition, the lab has a room dedicated to fingerprinting evidence that contains various fingerprinting powders and a Super Glue Chamber. There also is a room dedicated to Alternate Light Source (ALS) products. The main room in the lab is used for the packaging of evidence and is used as a temporary storage facility until the evidence can be taken to the property section and the state lab if further testing is needed.

The lab is supplied with packaging materials to include paper evidence bags, plastic evidence bags, evidence tape, paint cans, evidence paper, and various evidence boxes. The lab is also supplied with crime scene supplies to include Gunshot Residue Kits (GSR), DNA collection

materials, Fingerprint collection materials, Impression recovery materials, and Trace evidence collection materials. Stored in the ALS room are the chemicals that are used in various aspects of crime scene processing. The Materials Datasheet is kept in the lab. Lastly, the lab contains a supply of gloves, booties, and other protection equipment.

The Forensics Unit also has 4 crime scene vans and a crime scene command post vehicle. These vehicles are taken to crime scenes and contain basic crime scene collection materials. The Forensics Unit OIC is responsible for ensuring that all vehicles and equipment are maintained.

Crime scene command post:

Shovel, folding ladder, folding canopy,
Large, medium, small boxes
Roll of craft paper
Set of yard sticks for measuring
Large, medium, small, extra-large gloves
Gauze pads, 35 mm film, Mini DVD blank discs,
Death Investigation Manuals, box of toys for kids
Four extension cords, Evidence collection kit
Folding Fuming Chamber
Set of marking flags, knee pads, rope, magnet, sketch kit
Tripods, ALS and Digital Camera for Crime Scope
Spot lights, Crime Scope
Dewalt Reciprocating Saw, electric drill, tool box with assorted hand tools
Step stool and two stools
Small, Medium, Large paper bags
Small, Medium, Large plastic bags
Small, Medium, Large envelopes
Box of dust masks, Tyveks suits, Filtered masks, oil for generator
External Power Cord
Trajectory Kit, Large orange flashlight, Fire extinguisher, Ice scraper
Measuring tapes, Map kit, Blue max Kit, Antiputrefaction Kit
“Do Not Enter” Crime scene signs, Crime Scene Tape, Rolling wheel for measuring
Evidence Camera, Thief Detection Kit, Latent Print Kit, Silicone Casting Kit
Evidence Tape, Sharps containers, Metal Detector, Sifting Screens
Impression kit, Cans of Snow Wax, Swab Kits
Casting Material, Gallon paint cans, Privacy Screens
Two boxes of stale snacks, Water bottles
GSR Kits, Hot Shot Fingerprint Developer, Paper towels
Digital Video Camera, Coveralls

Crime Scene Van Inventory:

Shovel, Tool Box with assorted hand tools, Electric drill
Large, Small, Medium boxes
Small, Medium, Large, Extra Large Gloves

Gauze pads, 35mm film, Mini DVD blank Discs
Folding fuming chamber, Marking flags
Sketch Kit, Tripods, Spot Lights
Small, Medium, Large Paper bags
Small, Medium, Large Plastic bags
Small, Medium, Large Envelopes
Dust masks, Tyveks suits, Filtered masks
Trajectory kits, Large orange flashlights
Fire Extinguisher, Ice scraper
Measuring tapes, Blue max kit, Antiputrefaction Kit
Crime Scene tape, Rolling wheel for measuring
Latent print kit, Evidence tape, Metal detector
Sifting screens, Impression Kit, Swab kits,
Casting Material, GSR kits
Digital Video Camera